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**PATENT**

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Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on March 9, 2006

William R. Allen  
William R. Allen, Reg. No. 48,389

9 March 2006  
Date

Applicants: Toshiharu Furukawa et al.  
Serial No.: 10/711,764  
Filed: October 4, 2004  
Art Unit: 2823  
Examiner: Jarrett J. Stark  
Confirmation No.: 5763  
Title: LOW-K DIELECTRIC MATERIAL BASED UPON CARBON NANOTUBES  
Atty Docket No.: IBM-319

Cincinnati, Ohio 45202

March 9, 2006

**INFORMATION DISCLOSURE STATEMENT**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with the duty of candor and good faith imposed by 37 C.F.R. §1.56 and means of complying therewith according to 37 C.F.R. §§1.97 and 1.98, the references listed on the attached Form PTO-1449 are called to the attention of the United States Patent and Trademark Office in connection with the above-identified patent application.

Subject to the Office's waiver of providing copies of U.S. patents and published applications for applications filed after June 30, 2003, only foreign references and articles are provided, since this application was filed on October 4, 2004, and therefore, subsequent to June 30, 2003.

The Examiner is urged to consider all of the cited documents and to make an independent evaluation of the teachings and materiality of each.

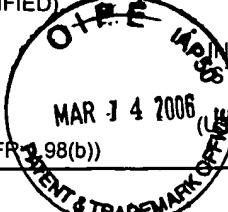
Applicants believe that no fee is due in connection with this communication. However, if this is not the case, the Commissioner is authorized to charge deposit account 23-3000 for any required fees.

Respectfully submitted,

WOOD, HERRON & EVANS, L.L.P.

BY William R. Allen  
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SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. IBM/319	SERIAL NO. 10/711,764
 (37 CFR 1.98(b))		INFORMATION DISCLOSURE STATEMENT BY APPLICANT  (Use several sheets if necessary)		APPLICANT Toshiharu Furukawa et al.	
				FILING DATE October 4, 2004	GROUP 2823

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EXAMINER INITIAL		PATENT NUMBER							ISSUE DATE	PATENTEE		CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	A.A	5	7	9	6	5	7	3	8/18/1998	Kotecki et al.		361	321.5	5/29/1997
	A.B	6	2	5	0	9	8	4	6/26/2001	Jin et al.		445	51	1/25/1999
	A.C	6	4	2	3	5	8	3	7/23/2002	Avouris et al.		438	132	1/3/2001
	A.D	6	5	1	5	3	2	5	2/4/2003	Farnworth et al.		257	296	3/6/2002
	A.E	6	8	5	8	8	9	1	2/22/2005	Farnworth et al.		257	296	12/9/2002
	A.F	6	8	9	1	2	2	7	5/10/2005	Appenzeller et al.		257	346	
	A.G													
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	A.I													
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		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION (YES/NO)
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	A.M	WO 2004/040616	3/13/2004	PCT	H01L		Abstract Only
	A.N	WO 2004/105140	12/2/2004	PCT	H01L 29/786		Abstract Only
	A.O	EP 1420414	April 6, 2005	EP	G11C 13/02	H01L 51/30	N/A
	A.P	EP 1 361 608	11/12/2003	EP	H01L 21/768	H01L 23/532	N/A
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A.S	Choi et al., United States Published Application No. 2002/0001905 A1, Publication Date: 1/3/2002
A.T	Furukawa et al., United States Patent Application Publication No. US 2005/0179029, Publication Date: August 18, 2005

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B.R	Y.Zhao, et al, "Film growth of pillars of multi-walled carbon nanotubes", J.PHys.: Condens. Matter 15 (2003) L565-L569
B.S	Zhang, et al, "Electric-field-directed growth of aligned single-walled carbon nanotubes", Applied Physics Letters, Volume 79, Number 19, 5 November 2001
B.T	<a href="http://neep.nasa.gov/index_nasa.cfm/769/#synthesis">http://neep.nasa.gov/index_nasa.cfm/769/#synthesis</a> , "Synthesis of CNT's"

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C.R	<u>C-H. Kiang, "Growth of Larger-Diameter Single-Walled Carbon Nanotubes," J.Phys. Chem. A 2000, 104, 2454-2456</u>		
C.S	<u>E.Ploenjes, et al, "Single-Walled Carbon Nanotube Synthesis in CO Laser Pumped Monoxide Plasma". Oct 10, 2001</u>		
C.T	<u>Y.Mo, et al, "The growth mechanism of carbon nanotubes from thermal cracking of acetylene over nickel catalyst supported on alumina." 2001 Elsevier Science B.V</u>		

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D.R	<u>M.Jung, et al, "Growth of carbon nanotubes by chemical vapor deposition," 2001 Elsevier Science B.V.</u>
D.S	<u>H.W.Zhu, et al, "Direct Synthesis of Long Single-Walled Carbon Nanotube Strands," 3 May 2002, Vol 296, Science</u>
D.T	<u>H.Cui, et al, "Growth behavior of carbon nanotubes on multilayered metal catalyst film on chemical vapor deposition." Chemical Physics Letters 374 (2003) 222-228</u>

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E.R	<u>J.Li, et al, "Highly-ordered carbon nanotube arrays for electronics applications". Applied Physics Letters, Vol 75, Number 3, 19 July 1999</u>		
E.S	<u>Furukawa et al., United States Patent Application No. US2005/O130341, Publication Date: June 16, 2005</u>		
E.T	<u>Roesner et al., United States Published Application No. 2003/O132461 A1, Publication Date: 7/17/2003</u>		

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F.R	Phillip G. Collins, et al., "Engineering Carbon Nanotubes and Nanotube Circuits Using Electrical Breakdown," <u>Science</u> , Vol. 292, pp.706-709, 27 April 2001
F.S	V. Derycke, et al., "Carbon Nanotube Inter- and Intra molecular Logic Gates," <u>Nano Letters</u> , xxxx Vol.0, No 0 A-D (Received August 16, 2001)
F.T	Phillip G. Collins, et al., "Nanotubes for Electronics," <u>Scientific American</u> , pp. 62-69, December 2000

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	G.R	S.J. Wind et al., <u>S.J. Wind, et al., "Vertical Scaling of Carbon Nanotube Field-Effect Transistors Using Top Gate Electrodes," Applied Physics Letters, Vol. 80, Number 20, 20 May 2002, pp. 3817-3819</u>
	G.S	<u>Z.F.Ren, "Growth, Characterization, and Potential Applications of Periodic Carbon Nanotube Arrays", Dept of Physics, Boston College... Updated, 2001</u>
	G.T	<u>Jun Li, et al, "Bottom-up approach for carbon nanotube interconnects", NASA Ames Research Center, Moffett Field, CA. Rec'd 5. December 2002, accepted 31 January 2003</u>

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	H.R	Anyuan Cao, et al, "Grapevine-like growth of single walled carbon nanotubes among vertically aligned multiwalled nanotube Arrays", Applied Physics Letters, Volume 79, Number 9, 27 August 2001
	H.S	Battelle No 12132, "Carbon Nanotube Arrays: Synthesis of Dense Arrays of Well-Aligned Carbon Nanotubes Completely Filled with Titanium Carbide on Titanium Substrates"
	H.T	Aileen Chang, et al, "Integration of Nanotubes into Devices", National Nanofabrication Users Network, page 58, Stanford Nanofabrication Facility

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I.R	Z.Huang., Z.F.Ren., "Growth of highly oriented carbon nanotubes by plasma-enhanced hot filament chemical vapor deposition." <u>Applied Physics Letters</u> , Vol 73, Number 26, 28 December 1998
I.S	G.S. Duesberg et al., <u>Large-Scale Integration of Carbon Nanotubes Into Silicon Based Microelectronics</u> , Proceedings of the SPIE, Bellingham, VA, Vol. 5118, May 21, 2003
I.T	Furukawa et al., <u>United States Patent Application Publication No. US 2005/0167655</u> , Publication Date: August 4, 2005

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K.R	Gorman, "Nanoscale Networks: Superlong nanotubes can form a grid". Science News Online, May 3, 2003; Vol 163, No 18
K.S	"Tiny nanotubes set new record", 7 August 2003. Nanotechweb.org
K.T	"IBM Scientists Develop Carbon Nanotube Transistor Technology," IBM.com News - news report concerning work published in Science, Vol. 292, Issue 5517, April 27, 2001 entitled "Engineering Carbon Nanotubes and Nanotube Circuits Using Electrical Breakdown."

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L.R	Ploenjes et al., <u>Synthesis of single-walled carbon nanotubes in vibrationally non-equilibrium carbon monoxide</u> , Chemical Physics Letters 352 (2002) pp. 342-247
L.S	Furukawa et al., <u>United States Patent Application Publication No. US 2005/0129948</u> , Publication Date: June 16, 2005
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EXAMINER INITIAL		PATENT NUMBER			ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	M.A								
	M.B								
	M.C								
	M.D								
	M.E								
	M.F								
	M.G								
	M.H								
	M.I								
	M.J								
	M.K								

## FOREIGN PATENTS OR PUBLISHED FOREIGN PATENT APPLICATIONS

		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION (YES/NO)
	M.L						
	M.M						
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	M.O						
	M.P						
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	M.R	V.N. Popov, Carbon Nanotubes: Properties and Application, Materials Science and Engineering, R. Vol. R43, No. 3, pp. 61-102 (1/15/2004) (Summary only)
	M.S	Furukawa et al., United States Patent Application Publication No. US 2005/O167740, Publication Date: August 4, 2005
	M.T	Dubin et al., United States Patent Application Publication No. US 2005/O167755, Publication Date: August 4, 2005

EXAMINER	DATE CONSIDERED
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SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. IBM/319	SERIAL NO. 10/711,764
INFORMATION DISCLOSURE STATEMENT BY APPLICANT  (Use several sheets if necessary) (37 CFR 1.98(b))		APPLICANT Toshiharu Furukawa et al.			
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N.R	Farnsworth et al., <u>United States Patent Application No. 2003/O168683</u> , Publication Date: 9/11/2003		
N.S	Choi et al., <u>United States Patent Application No. 2003/O170930</u> , Publication Date: 9/11/2003		
N.T	Appenzeller et al., <u>United States Patent Application No. 2003/O178617</u> , Publication Date: 9/25/2003		

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	O.R	P.Harris, "Carbon Nanotubes and related structures", Cambridge University Press 1999.
	O.S	K.Teo, et al, "Catalytic Synthesis of Carbon Nanotubes and Nanofibers", Encyclopedia of Nanoscience and Nanotechnology, Vol X, pp 1-22, copyright 2003
	O.T	

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